



Pediatric Immunization Update 2012

**Andrew Kroger, MD, MPH
National Center for Immunization and
Respiratory Diseases**

**Niagara/Erie County Departments of
Health**

Depew, NY

May 23, 2012

SAFER • HEALTHIER • PEOPLE™



Disclosures

Andrew Kroger is a federal government employee with no financial interest or conflict with the manufacturer of any product named in this presentation

Andrew Kroger will not discuss a vaccine not currently licensed by the FDA

SAFER • HEALTHIER • PEOPLE™



Disclosures



Andrew Kroger will discuss off-label uses of meningococcal conjugate vaccine (MCV4) and tetanus toxoid reduced-diphtheria toxoid acellular pertussis (Tdap) vaccine

SAFER • HEALTHIER • PEOPLE™



What's New in Immunization



Childhood Schedule

Rotavirus Vaccine

Pertussis Vaccine

MCV4 vaccine

Measles Outbreaks

SAFER • HEALTHIER • PEOPLE™

FIGURE 1: Recommended immunization schedule for persons aged 0 through 6 years—United States, 2012 (for those who fall behind or start late, see the catch-up schedule [Figure 3])

Vaccine ▼	Age ►	Birth	1 month	2 months	4 months	6 months	9 months	12 months	15 months	18 months	19–23 months	2–3 years	4–6 years	
Hepatitis B ¹	Hep B		HepB			HepB		HepB						Range of recommended ages for all children
Rotavirus ²				RV	RV	RV ²								
Diphtheria, tetanus, pertussis ³				DTaP	DTaP	DTaP	see footnote ³	DTaP					DTaP	
<i>Haemophilus influenzae</i> type b ⁴				Hib	Hib	Hib ⁴		Hib						Range of recommended ages for certain high-risk groups
Pneumococcal ⁵				PCV	PCV	PCV		PCV				PPSV		
Inactivated poliovirus ⁶				IPV	IPV	IPV		IPV					IPV	
Influenza ⁷						Influenza (Yearly)								
Measles, mumps, rubella ⁸								MMR		see footnote ⁸			MMR	Range of recommended ages for all children and certain high-risk groups
Varicella ⁹								Varicella		see footnote ⁹			Varicella	
Hepatitis A ¹⁰								Dose 1 ¹⁰				HepA Series		
Meningococcal ¹¹								MCV4 — see footnote ¹¹						

This schedule includes recommendations in effect as of December 23, 2011. Any dose not administered at the recommended age should be administered at a subsequent visit, when indicated and feasible. The use of a combination vaccine generally is preferred over separate injections of its equivalent component vaccines. Vaccination providers should consult the relevant Advisory Committee on Immunization Practices (ACIP) statement for detailed recommendations, available online at <http://www.cdc.gov/vaccines/pubs/acip-list.htm>. Clinically significant adverse events that follow vaccination should be reported to the Vaccine Adverse Event Reporting System (VAERS) online (<http://www.vaers.hhs.gov>) or by telephone (800-822-7967).

FIGURE 2: Recommended immunization schedule for persons aged 7 through 18 years—United States, 2012 (for those who fall behind or start late, see the schedule below and the catch-up schedule [Figure 3])

Vaccine ▼	Age ►	7–10 years	11–12 years	13–18 years	
Tetanus, diphtheria, pertussis ¹		1 dose (if indicated)	1 dose	1 dose (if indicated)	Range of recommended ages for all children
Human papillomavirus ²		see footnote ²	3 doses	Complete 3-dose series	
Meningococcal ³		See footnote ³	Dose 1	Booster at 16 years old	
Influenza ⁴		Influenza (yearly)			Range of recommended ages for catch-up immunization
Pneumococcal ⁵		See footnote ⁵			
Hepatitis A ⁶		Complete 2-dose series			
Hepatitis B ⁷		Complete 3-dose series			
Inactivated poliovirus ⁸		Complete 3-dose series			Range of recommended ages for certain high-risk groups
Measles, mumps, rubella ⁹		Complete 2-dose series			
Varicella ¹⁰		Complete 2-dose series			

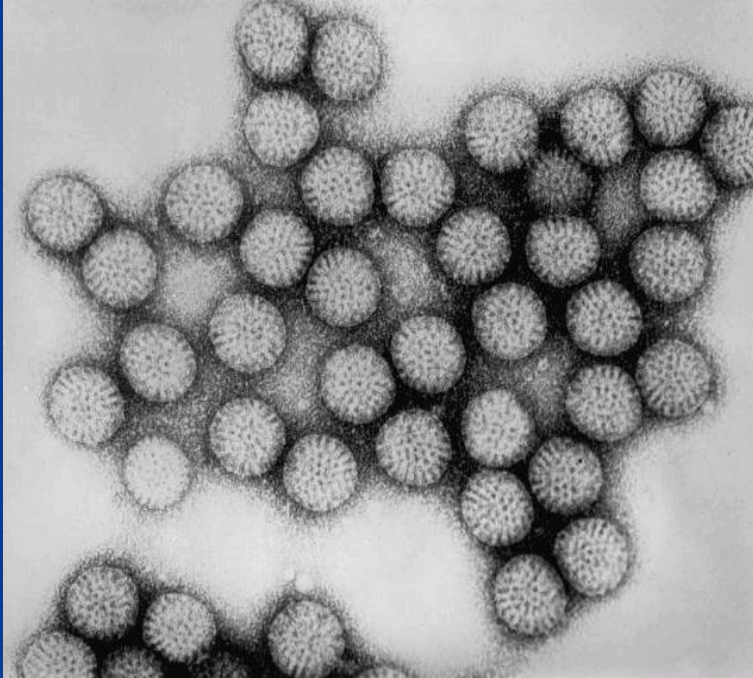
This schedule includes recommendations in effect as of December 23, 2011. Any dose not administered at the recommended age should be administered at a subsequent visit, when indicated and feasible. The use of a combination vaccine generally is preferred over separate injections of its equivalent component vaccines. Vaccination providers should consult the relevant Advisory Committee on Immunization Practices (ACIP) statement for detailed recommendations, available online at <http://www.cdc.gov/vaccines/pubs/acip-list.htm>. Clinically significant adverse events that follow vaccination should be reported to the Vaccine Adverse Event Reporting System (VAERS) online (<http://www.vaers.hhs.gov>) or by telephone (800-822-7967).

FIGURE 3. Catch-up immunization schedule for persons aged 4 months through 18 years who start late or who are more than 1 month behind —United States • 2012
 The figure below provides catch-up schedules and minimum intervals between doses for children whose vaccinations have been delayed. A vaccine series does not need to be restarted, regardless of the time that has elapsed between doses. Use the section appropriate for the child's age. **Always use this table in conjunction with the accompanying childhood and adolescent immunization schedules (Figures 1 and 2) and their respective footnotes.**

Persons aged 4 months through 6 years					
Vaccine	Minimum Age for Dose 1	Minimum Interval Between Doses			
		Dose 1 to dose 2	Dose 2 to dose 3	Dose 3 to dose 4	Dose 4 to dose 5
Hepatitis B	Birth	4 weeks	8 weeks and at least 16 weeks after first dose; minimum age for the final dose is 24 weeks		
Rotavirus ¹	6 weeks	4 weeks	4 weeks ¹		
Diphtheria, tetanus, pertussis ²	6 weeks	4 weeks	4 weeks	6 months	6 months ²
<i>Haemophilus influenzae</i> type b ³	6 weeks	4 weeks if first dose administered at younger than age 12 months 8 weeks (as final dose) if first dose administered at age 12–14 months No further doses needed if first dose administered at age 15 months or older	4 weeks ³ if current age is younger than 12 months 8 weeks (as final dose) ³ if current age is 12 months or older and first dose administered at younger than age 12 months and second dose administered at younger than 15 months No further doses needed if previous dose administered at age 15 months or older	8 weeks (as final dose) This dose only necessary for children aged 12 months through 59 months who received 3 doses before age 12 months	
Pneumococcal ⁴	6 weeks	4 weeks if first dose administered at younger than age 12 months 8 weeks (as final dose for healthy children) if first dose administered at age 12 months or older or current age 24 through 59 months No further doses needed for healthy children if first dose administered at age 24 months or older	4 weeks if current age is younger than 12 months 8 weeks (as final dose for healthy children) if current age is 12 months or older No further doses needed for healthy children if previous dose administered at age 24 months or older	8 weeks (as final dose) This dose only necessary for children aged 12 months through 59 months who received 3 doses before age 12 months or for children at high risk who received 3 doses at any age	
Inactivated poliovirus ⁵	6 weeks	4 weeks	4 weeks	6 months ⁵ minimum age 4 years for final dose	
Meningococcal ⁶	9 months	8 weeks ⁶			
Measles, mumps, rubella ⁷	12 months	4 weeks			
Varicella ⁸	12 months	3 months			
Hepatitis A	12 months	6 months			
Persons aged 7 through 18 years					
Tetanus, diphtheria/ tetanus, diphtheria, pertussis ⁹	7 years ⁹	4 weeks	4 weeks if first dose administered at younger than age 12 months 6 months if first dose administered at 12 months or older	6 months if first dose administered at younger than age 12 months	
Human papillomavirus ¹⁰	9 years	Routine dosing intervals are recommended ¹⁰			
Hepatitis A	12 months	6 months			
Hepatitis B	Birth	4 weeks	8 weeks (and at least 16 weeks after first dose)		
Inactivated poliovirus ⁵	6 weeks	4 weeks	4 weeks ⁵	6 months ⁵	
Meningococcal ⁶	9 months	8 weeks ⁶			
Measles, mumps, rubella ⁷	12 months	4 weeks			
Varicella ⁸	12 months	3 months if person is younger than age 13 years 4 weeks if person is aged 13 years or older			



Rotavirus



**Most common cause of
severe diarrhea in
children**

**All children worldwide
infected by age 5**

**Improvements in
sanitation won't
substantially reduce
disease incidence**

**Limited strains in
circulation**

SAFER • HEALTHIER • PEOPLE™



Rotavirus Disease in the United States



Annually responsible for:

>400,000 physician visits

160,000 emergency dept visits

55,000-70,000 hospitalizations

20-60 deaths

\$300 million in medical costs

\$1 billion in direct and indirect costs



SAFER • HEALTHIER • PEOPLE™



Rotavirus Vaccines - Efficacy

Rotarix – Trials in Latin America and Europe

Any disease 86.6% (86 -87.1)

Severe disease 91.6% (84.7-95.7) *Ruiz-Palacios, NEJM 2006, Vesikari T Lancet 2007*

RotaTeg – Rotavirus Efficacy and Safety Trial (REST)

Any disease 73.8%

Severe disease 98.2%



Intussusception (IS)

Prolapse of one section of bowel into another section

Most common cause of acute intestinal obstruction in infants younger than 1 year

Can be associated with adenovirus infection and Meckel's diverticulum; cause often unknown

**Highest incidence at about 6 months of age
(approximately 65 inpatient cases per 100,000 per year)**

MMWR 2007;56:218-22

SAFER • HEALTHIER • PEOPLE™



March 19, 1999 / Vol. 48 / No. RR-2

MMWRTM

**MORBIDITY AND MORTALITY
WEEKLY REPORT**

Recommendations and Reports

Rotavirus Vaccine for the Prevention of Rotavirus Gastroenteritis Among Children

Recommendations of the Advisory Committee on Immunization Practices (ACIP)

Vol. 48 / No. 43

MMWR
November 5, 1999

1007

Withdrawal of Rotavirus Vaccine Recommendation

In July 1999, CDC recommended that health-care providers and parents postpone use of the rhesus rotavirus vaccine-tetavalent (RRV-TV) (RotaShield[®], Wyeth Laboratories, Inc., Marietta, Pennsylvania), for infants, at least until November 1999. This action was based on reports to the Vaccine Adverse Event Reporting System of intussusception (a type of bowel obstruction that occurs when the bowel folds in on itself) among 15 infants who received rotavirus vaccine. Also at that time, the manufacturer, in consultation with the Food and Drug Administration, voluntarily ceased further distribution of the vaccine.

On October 22, 1999, the Advisory Committee on Immunization Practices (ACIP), after a review of scientific data from several sources, concluded that intussusception occurs with significantly increased frequency in the first 1–2 weeks after vaccination with RRV-TV, particularly following the first dose. Therefore, ACIP no longer recommends vaccination of infants in the United States with RRV-TV and withdraws its recommendation that RRV-TV be administered at 2, 4, and 6 months of age. Children who received rotavirus vaccine before July and remain well are not now at increased risk for intussusception.

Rotavirus remains the cause of a substantial health burden for children in the



**March 19, 1999
RRV-TV
recommended**

**November 5,
1999
RRV-TV
recommendation
withdrawn**

Intussusception (IS)



from Damjanov, 1996

SAFER • HEALTHIER • PEOPLE™



Pentavalent Rotavirus Vaccine (RotaTeq)

Rotavirus Efficacy and Safety Trial (REST)

**Phase III trial included 71,799 infants
in 11 countries (mostly U.S. and
Finland)**

**No serious adverse reactions
identified, including intussusception**

New Eng J Med 2006;354:23-33

SAFER • HEALTHIER • PEOPLE™



Rotavirus Vaccine and Intussusception*



	Vaccine Recipients	Placebo Recipients
Within 42 days of vaccination	6 cases	13 cases
Within 1 year of vaccination	13 cases	15 cases

*No increased risk of IS was identified in the Rotarix clinical trials
New Eng J Med 2006;354:23-33

SAFER • HEALTHIER • PEOPLE™



Rotavirus Vaccine: Post-licensure Intussusception



**Data are mixed as to risk of
intussusception following first dose of
rotavirus vaccine**

Post-licensure trials

World Health Organization (WHO) Cohort study
– Mexico, Brazil

Safety surveillance – Australia

CDC case-control studies

SAFER • HEALTHIER • PEOPLE™



Rotavirus vaccine

Contraindications

Severe Combined Immunodeficiency Disease (SCID)

Infants with hx of intussusception

Serious allergy to vaccine component

Rotarix contains latex

SAFER • HEALTHIER • PEOPLE™



Pertussis



SAFER • HEALTHIER • PEOPLE™



Recent Pertussis Trends

**Pertussis cases increased in the late 1990s
and early 2000s**

2010 – 27,550 pertussis cases

2010 - California – ten infant deaths

**Severe illness among young infants with
pertussis**

Pertussis immunity wanes in 5-10 years

SAFER • HEALTHIER • PEOPLE™



Source of Infection for Infants With Pertussis

Household contact – 71%

- Parent – 55% (mother 37%, father 18%)
- Sibling – 16%

Non-household contact – 29%

- Aunt/uncle – 10%
- Friend/cousin – 10%
- Grandparent – 6%

N=44 infants ≤ 6 months of age. *Pediatr Infect Dis J* 2007;26(4):293-9.

SAFER • HEALTHIER • PEOPLE™



Tdap Recommendations for Adolescents/Adults



**Persons 11 through 64 years of age
who have not received Tdap should
receive a dose followed by Td
booster doses every 10 years**

**Adolescents should preferably receive
Tdap at the 11 to 12 year-old
preventive healthcare visit**

MMWR 2011; 60 (No. 1):13-5

SAFER • HEALTHIER • PEOPLE™



New Tdap Recommendations for Adolescents



Children 7 through 18 years of age who are not fully immunized against pertussis (including those never vaccinated or with unknown pertussis vaccination status) should receive a single dose of Tdap

off-label recommendation. *MMWR* 2011; 60 (No. 1):13-5

SAFER • HEALTHIER • PEOPLE™



New Tdap Recommendations for Adolescents

“fully immunized”

- 5 doses of DTaP
- 4 doses of DTaP if 4th administered after the 4th birthday

MMWR 2011; 60 (No. 1):13-5

SAFER • HEALTHIER • PEOPLE™



Adolescent Tdap



Dose of Tdap as 4th, 5th
dose of DTaP

Dose of Tdap at 11-12
years

Dose of Tdap given at 7
year – 10 years

Dose of Td (ten years
later)

Dose of DTaP at 7 year
- 10 years

Provider discretion -
Dose of Tdap at 11-12
years

SAFER • HEALTHIER • PEOPLE™

Updated Recommendations for Use of Tetanus Toxoid, Reduced Diphtheria Toxoid and Acellular Pertussis (Tdap) Vaccine from the Advisory Committee on Immunization Practices, 2010

Despite sustained high coverage for childhood pertussis vaccination, pertussis remains poorly controlled in the United States. A total of 16,858 pertussis cases and 12 infant deaths were reported in 2009 (1; CDC, unpublished data, 2009). Although 2005 recommendations by the Advisory Committee on Immunization Practices (ACIP) called for vaccination with tetanus toxoid, reduced diphtheria toxoid and acellular pertussis (Tdap) for adolescents and adults to improve immunity against pertussis, Tdap coverage is 56% among adolescents and <6% among adults (2,3). In October 2010, ACIP recommended expanded use of Tdap. This report provides the updated recommendations, summarizes the safety and effectiveness data considered by ACIP, and provides guidance for implementing the recommendations.

ACIP recommends a single Tdap dose for persons aged 11

the United States, the additional recommendations are made to facilitate use of Tdap to reduce the burden of disease and risk for transmission to infants (Box).

Timing of Tdap Following Td

Safety. When Tdap was licensed in 2005, the safety of administering a booster dose of Tdap at intervals <5 years after Td or pediatric DTP/DTaP had not been studied in adults. However, evaluations in children and adolescents suggested that the safety of intervals as short as 18 months was acceptable (6). Rates of local and systemic reactions after Tdap vaccination in adults were lower than or comparable to rates in adolescents during U.S. prelicensure trials; therefore, the safety of using intervals as short as 2 years between Td and Tdap in adults was inferred (4).

MMWR 2011; 60 (No. 1):13-5

SAFER • HEALTHIER • PEOPLE™

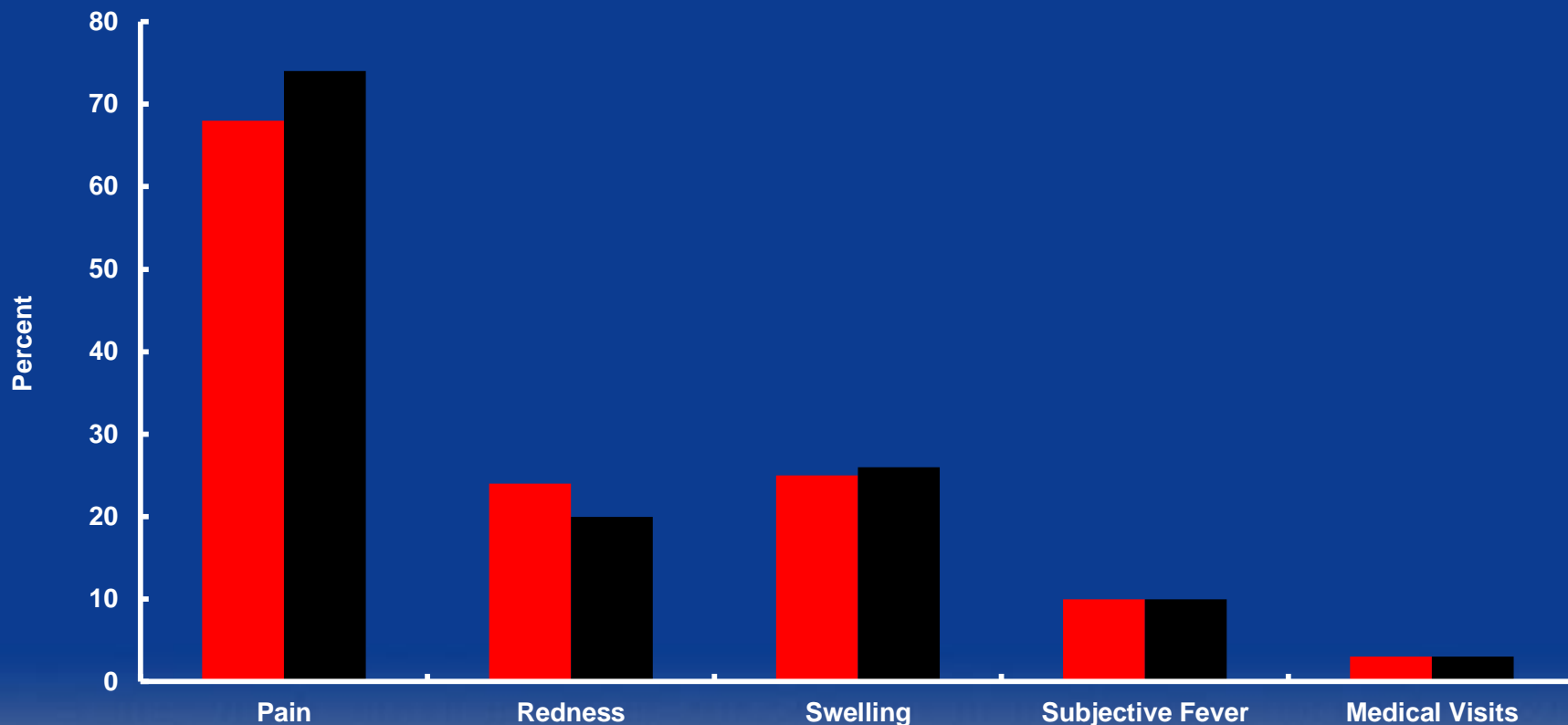


Tdap Adverse Event Rates by Interval Since Previous Td/TT



■ < 2 yrs since Td/TT

■ ≥ 2 yrs since Td/TT



Talbot et al. *Vaccine* 2010;28:8001-7

Solicited Adverse Event

SAFER • HEALTHIER • PEOPLE™



New Tdap Interval Recommendations*

Tdap can be administered regardless of the interval since the last tetanus and diphtheria containing vaccine

ACIP concluded that while longer intervals between Td and Tdap vaccination could decrease the occurrence of local reactions, the benefits of protection against pertussis outweigh the potential risk for adverse events

***off-label recommendation. *MMWR* 2011; 60 (No. 1):13-5**

SAFER • HEALTHIER • PEOPLE™



When to Give Tdap



CDC doesn't recommend a mass recall to give Tdap

If patient in office at high risk of transmitting and acquiring pertussis

- **In a pertussis outbreak**
- **Has or anticipates having contact with infant**
- **Health-care person**

Then disregard interval and give Tdap

SAFER • HEALTHIER • PEOPLE™



Only one recommended dose of
Tdap is recommended at this
time!

SAFER • HEALTHIER • PEOPLE™



Violation of Primary Series Intervals



If high risk for pertussis transmission or acquisition
give Tdap regardless of interval

Pertussis dose counts, but tetanus and diphtheria will be invalid due to minimum interval violations

SAFER • HEALTHIER • PEOPLE™



Meningococcal Disease





Persons at Highest Risk of Meningococcal Disease or Suboptimal Vaccine Response

Complement deficiency

- High-risk of disease
- Very high antibody titer required to compensate for complement deficiency

Asplenia

- High-risk of disease
- evidence of suboptimal response

SAFER • HEALTHIER • PEOPLE™



Persons with Suboptimal Vaccine Response

HIV infection

- evidence of suboptimal response

Single dose primary series may not be sufficient to confer protection for persons with these high-risk conditions

SAFER • HEALTHIER • PEOPLE™



MCV4 Primary Series Recommendation



Administer 2 doses of MCV4 at
least 8 weeks apart to persons
with persistent complement
component deficiency and
anatomic or functional asplenia

MMWR 2011;60(No. 3):72-6.

SAFER • HEALTHIER • PEOPLE™



MCV4 Primary Series Recommendation

HIV infection is **not** an indication for MCV4
vaccination

However, some persons with HIV infection
should receive MCV4 (adolescents, some
international travelers, microbiologists,
etc)

Persons with HIV infection who are
vaccinated with MCV4 should receive 2
doses at least 8 weeks apart

MMWR 2011;60(No. 3):72-6.

SAFER • HEALTHIER • PEOPLE™



FDA Approval: Menactra



June 2011: Menactra
(MCV4-D) approved for
high-risk infants

2 dose series at 9 months
and 12 months

SAFER • HEALTHIER • PEOPLE™



New MCV4 Recommendations



Certain persons recommended for
infant series

Persistent complement component
deficiency

Travelers to high-risk meningococcal
areas

Infants in a meningococcal outbreak
HIV infection (permitted)

SAFER • HEALTHIER • PEOPLE™



New MCV4-D Recommendations



Infant vaccination 2 dose series

Dose 1: 9 months

Dose 2: 12 months

Minimum interval
between doses 2 months

SAFER • HEALTHIER • PEOPLE™



Infant Vaccination: Asplenia



Persons with functional or
anatomic asplenia NOT
recommended for infant
vaccination with MCV4-D

Still recommended for 2 dose
series beginning at age 2
years

SAFER • HEALTHIER • PEOPLE™



Asplenia



Persons with asplenia are at higher risk for
invasive pneumococcal disease

Dose of PCV13 recommended at 12 – 18
months of age

Evidence of interaction between PCV13 and
MCV4-D affecting the immune response
to PCV13

Because of the risk of interaction, MCV4 not
recommended for asplenic children when
they should be receiving PCV13

SAFER • HEALTHIER • PEOPLE™



MMWRTM

Morbidity and Mortality Weekly Report

Recommendations and Reports

May 27, 2005 / Vol. 54 / No. RR-7

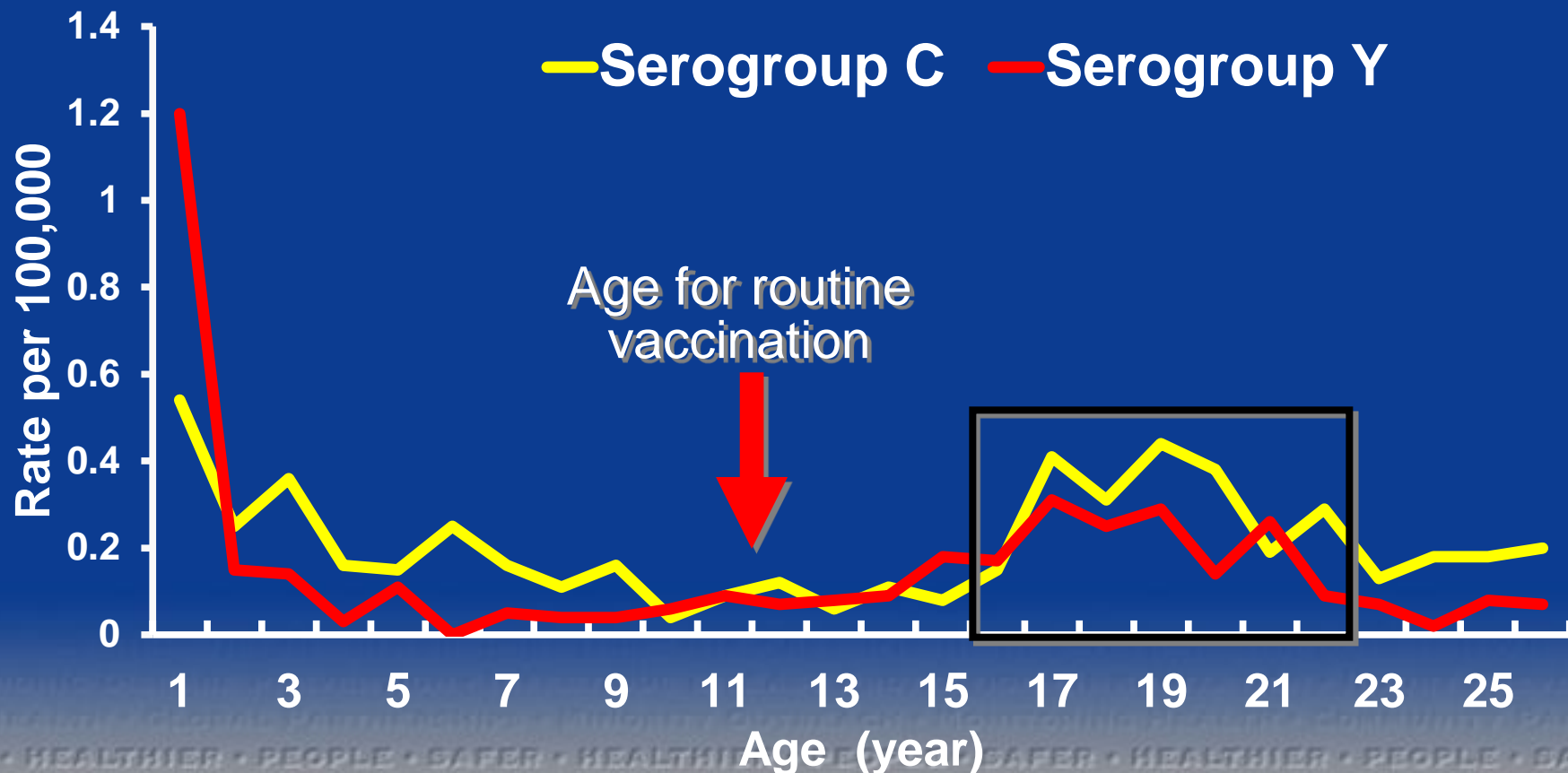
Prevention and Control of Meningococcal Disease

Recommendations of the Advisory Committee
on Immunization Practices (ACIP)

SAFER • HEALTHIER • PEOPLETM



Rates of Meningococcal Disease (C and Y) by Age, 1999-2008



Active Bacterial Core surveillance (ABCs), 1998-2008

SAFER • HEALTHIER • PEOPLE™



Meningococcal Conjugate (MCV4) Routine Revaccination



In its 2005 recommendations for MCV, ACIP made no recommendation about revaccination pending the availability of additional data

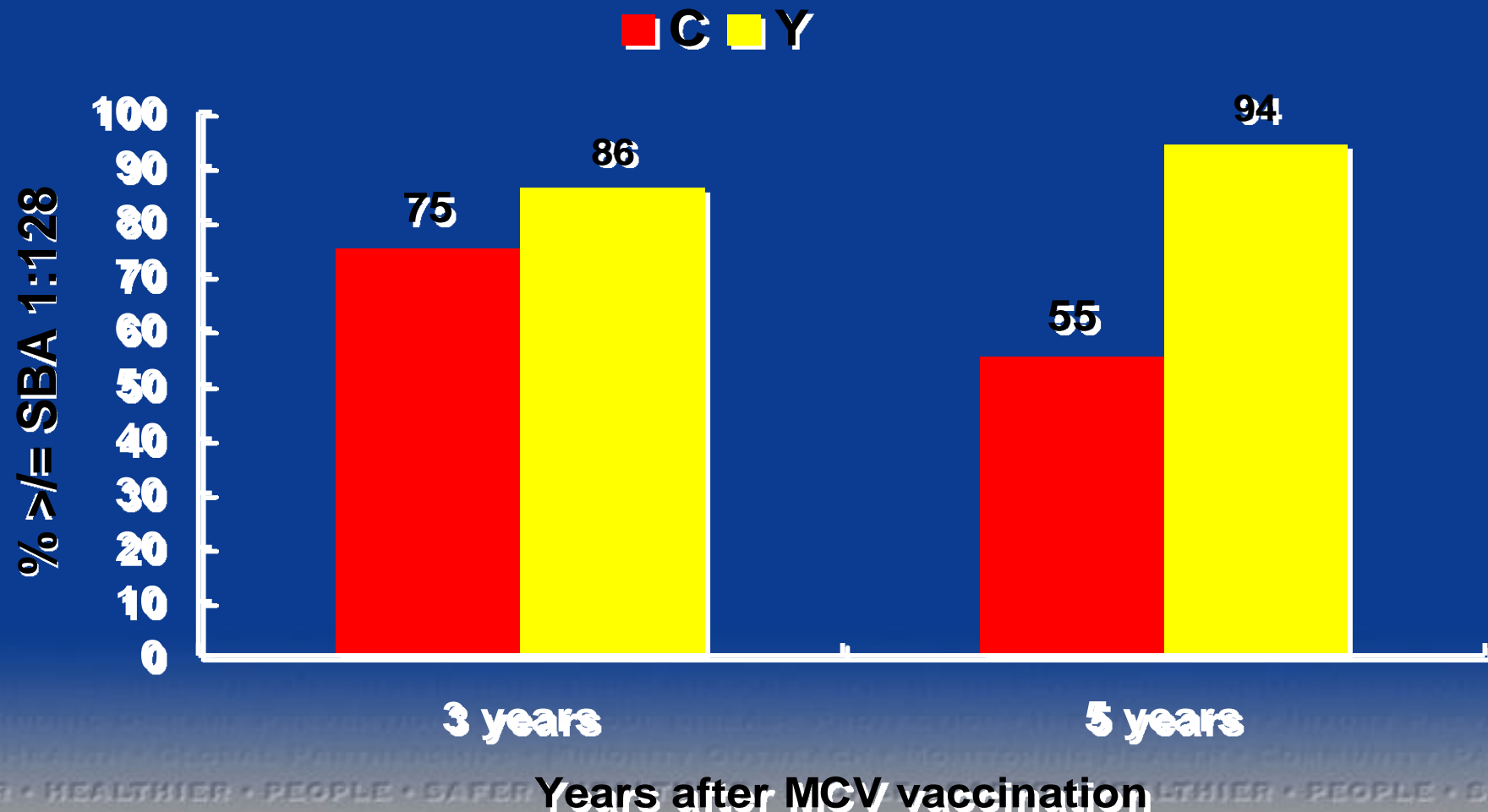
Serologic data are now available from the manufacturer that show significant decline in antibody 3-5 years after vaccination although few “breakthrough” cases have been reported

MMWR 2009;58(No. 37):1042-3

SAFER • HEALTHIER • PEOPLE™



Seroprotection Rates Following MCV Vaccination



MMWR 2009;58(No. 37):1042-3

SAFER • HEALTHIER • PEOPLE™



Updated Recommendations for Use of Meningococcal Conjugate Vaccines — Advisory Committee on Immunization Practices (ACIP), 2010

On October 27, 2010, the Advisory Committee on Immunization Practices (ACIP) approved updated recommendations for the use of quadrivalent (serogroups A, C, Y, and W-135) meningococcal conjugate vaccines (Menveo, Novartis; and Menactra, Sanofi Pasteur) in adolescents and persons at high risk for meningococcal disease. These recommendations supplement the previous ACIP recommendations for meningococcal vaccination (1,2). The Meningococcal Vaccines Work Group of ACIP reviewed available data on immunogenicity in high-risk groups, bactericidal antibody persistence after immunization, current epidemiology, vaccine effectiveness (VE), and cost-effectiveness of different strategies for vaccination of adolescents. The Work Group then presented policy options for consideration by the full ACIP. This report summarizes two new recommendations approved by ACIP: 1) routine vaccination of adolescents, preferably at age 11 or

Meningococcal disease incidence has decreased since 2000, and incidence for serogroups C and Y, which represent the majority of cases of vaccine-preventable meningococcal disease, are at historic lows. However, the peak in disease among persons aged 18 years (Figure) has persisted, even after routine vaccination was recommended in 2005. In the 2009 National Immunization Survey-Teen, 53.6% of adolescents aged 13 through 17 years had received a dose of meningococcal vaccine (3). From 2000–2004 to 2005–2009, the estimated annual number of cases of serogroups C and Y meningococcal disease decreased 74% among persons aged 11 through 14 years but only 27% among persons aged 15 through 18 years. Cases of meningococcal disease caused by serogroups C and Y among persons who were vaccinated with meningococcal conjugate vaccine have been reported. An early VE analysis that modeled expected cases of disease in vaccinated persons estimated a VE



New MCV4 Recommendations*

- administer MCV4 at age 11 or 12 years with a **booster dose** at 16 years of age
- administer 1 dose at age 13 through 15 years if not previously vaccinated
- for persons vaccinated at age 13 through 15 years administer a 1-time booster dose is recommended, preferably at or after 16 through 18 years of age

*off-label recommendation. *MMWR* 2011;60(No. 3):72-6.

SAFER • HEALTHIER • PEOPLE™



New MCV4 Adolescent Vaccination Recommendations



The minimum interval between doses is 8 weeks

A booster dose is not recommended for healthy persons if the first dose is administered at 16-21 years of age

The booster dose is generally not recommended after the 19th birthday; however, both an initial dose and/or a booster dose can be given to someone between 19 through 21 years old if they are a first-year student living in a residence hall.

SAFER • HEALTHIER • PEOPLE™



MCV4 vs MPSV4



Conjugate vaccines boost the immune response

If MPSV4 is substituted for MCV4 for the booster dose, or for a primary series dose in high-risk, the dose should be repeated

SAFER • HEALTHIER • PEOPLE™



MCV Revaccination Recommendations



Other high-risk persons recommended for revaccination

- microbiologists with prolonged exposure to *Neisseria meningitidis*
- frequent travelers to or persons living in areas with high rates of meningococcal disease

Revaccinate **every 5 years** as long as the person remains at increased risk

Every 3 years if first dose given between 2 through 6 years of age

- MCV4 for persons 2 through 55 years of age
- MPSV for persons 56 years and older

SAFER • HEALTHIER • PEOPLE™



Measles



In 2011
222 cases of
measles
reported in U.S.
Highest number
since 1996

SAFER • HEALTHIER • PEOPLE™



MMR



A dose is recommended for
travelers between 6 through 12
months of age

Does NOT count toward the two
dose routine series

High-risk countries: France, India
(generally Europe, Africa, Asia)

SAFER • HEALTHIER • PEOPLE™



MMR



86% percent of cases
were not vaccinated or
did not know

35% of those eligible had
personal or religious
belief exemptions

SAFER • HEALTHIER • PEOPLE™



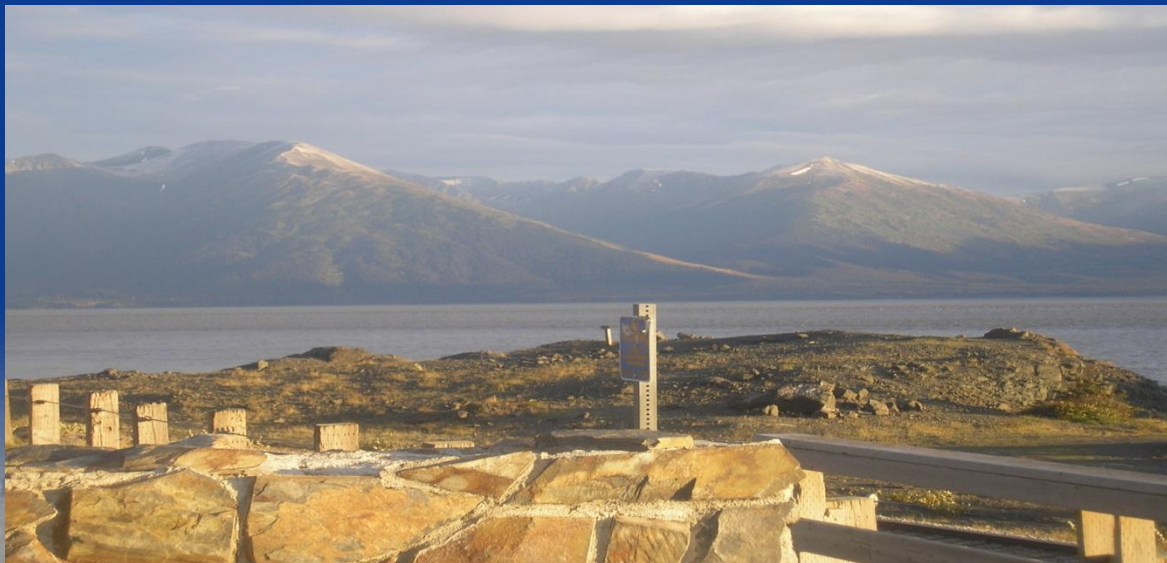
Thank You



Hotline: 800.CDC.INFO

Email: nipinfo@cdc.gov

Website: www.cdc.gov/vaccines



SAFER • HEALTHIER • PEOPLE™